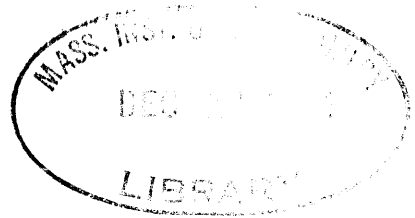


A STUDY OF LOW - RISE, HIGH - DENSITY HOUSING



A thesis submitted in partial fulfillment of the requirements for the degree of Master of Architecture at the Massachusetts Institute of Technology.

August 25, 1961

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Dean Pietro Belluschi

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THE ABSTRACT

The major objectives of this study are twofold - first, to establish a clear social and physical structure for residential development and its relationship to the total city. Secondly, to create a residential environment based upon individual and family needs that will increase the choice available in urban housing. The proposal is a system of low-rise housing which is not designed to meet the needs of any particular site, but is rather treated as a part of a new urban form.

Cambridge, Massachusetts

August 25, 1961

Pietro Belluschi, Dean
School of Architecture and Planning
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

Dear Dean Belluschi:

I hereby submit this thesis, entitled " A Study of Low-Rise,
High-Density Housing " in partial fulfillment of the require-
ments for the degree of Master in Architecture.

Very truly yours,

Robert J. Karn

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THE PROBLEM

Providing shelter for the basic social unit, the family, and the locale for individual and family-centered activities are only the more obvious functions of housing. It is interrelated with all phases of human activity - political, social, and economic. It follows then that the designer cannot limit his concern to the unit development or its immediate proximity, but must consider its relationship to the total environment.

The tremendous growth of urban areas following the industrial revolution has destroyed the established social and physical order of the historical city. With rising land costs, increasing taxes and aided by continuing subsidies for private transportation, the city has expanded over the surrounding countryside in an endless amorphous growth. Recognizable centers of activity have ceased to exist as shopping centers, offices, and cultural institutions no longer provide points for association but are scattered in a random pattern serving undefined areas. Even the natural barriers which gave form to older cities were no match for our modern machinery and so trees were removed, rivers diverted or filled, and hillsides leveled. Small, established, towns having a semblance of organization by virtue of their limited size and slow growth rate have been caught in the squeeze of expansion until they are no longer distinguishable.

This chaotic expansion and dispersal of urban life has created a detachment among individuals and a general weakening of any capacity for

group activity or action. Friends and acquaintances may be found scattered throughout the city while one is surrounded by strangers. While this distribution of contacts throughout the city has the advantage of encouraging choice in association, the general trend of this development causes a remoteness between the individual and the city by discouraging participation and interest. Local civic affairs, politics, and education are in this way de-emphasized and leadership is passed by default to some higher, central authority.

In addition to the lack of an organized structure which establishes its relationship to the city, urban housing has also suffered by the failure to provide within the urban residential framework an environment which encourages family life.

It is rather disturbing to continually see proposals based upon some technical innovation at the expense of those human values which should form the basis for design decisions. Too often the answer to an urban housing form has been supplied by only one solution - that of high rise slabs or towers. Unfortunately, questions involving the advantages or disadvantages of such living, of the limitations of choice this imposes, or the part it plays in encouraging families with the means to escape the city for the suburbs, do not seem to have been considered.

"To keep the advantages first incorporated in the romantic suburb, we must acclimate them to the building of cities. To keep the advantages first discovered in the closed city, we must create a more porous pattern, richer in both social and esthetic variety. Residential densities of about one hundred people per net acre, exclusive of streets and sidewalks, will provide usable private gardens and encourage small public inner parks for meeting and relaxing. This can be achieved without erecting the sterile, space-mangling high-rise slabs that now grimly parade, in both Europe and America, as the ultimate contribution of 'modern' architecture. " ¹

¹ Lewis Mumford, The City in History, 551 pp. Harcourt, Brace, and World, Inc., 1961.

THE PROPOSAL

This housing proposal is designed to allow renting or buying of the living unit. All other facilities and property remain public, owned by the city or a co-operative composed of the residents. This arrangement of ownership would relieve residents of the major problems of building and grounds maintenance, while retaining small private outdoor spaces for gardening, and other recreational activities.

The solution emphasizes the living unit, with undulating facade and garden walls. In this manner, a richness and variety is achieved in the spacial sequence. The building of low-rise housing within urban areas must present a pleasing pattern when viewed from high-rise structures and for this reason the roof design becomes an important feature in the over-all developement.

The following organization has been used as a guide in the housing study instead of any specific program. This organization begins with the unit and concludes at the scale of the city. The actual design includes the block developement, while the relationship with adjacent blocks, the neighborhood and finally the city scale is presented in diagrammatic form.

Living Unit

The units vary in size and space disposition, including one, two, three, and four bedrooms. Flexibility within the unit space arrangement allows upper level bedrooms to be substituted for two story living areas as changes occur in family requirements.

Major entrances are from a common entry space within each cluster.

Definition and privacy between adjacent individual family areas are aided by common service walls.

With the exception of the one bedroom living unit, each family has a private outdoor space.

Cluster

The clusters are three and four stories in height. The three story cluster houses six families and the four story cluster houses eight. Heating, trash and garbage disposal, laundry area, bulky storage, and the stairway are common facilities at the scale of the cluster.

Group

Four to six clusters form a group, which defines a semi-private space having two major and two minor points of access.

A covered parking area is provided for residents.

Residential Block

The block contains 204 families and is slightly less than twelve acres in area. The block size was determined so as to be capable of supporting a small nursery school.

A density of approximately sixty persons per acre, including public walkways, open spaces, and all resident and guest parking areas is achieved.

The arrangement of housing groups is based upon a rectilinear block system with open space in the center of each block. This area would contain play equipment for children up to nine or ten years of age.

The block is defined by vehicular streets and all service functions and guest parking are kept at the perimeter. Circulation within the block is completely devoted to the pedestrian with no interference from vehicles.

Neighborhood

The neighborhood would be based upon six to eight residential blocks located about a neighborhood center and defined by more important vehicular streets.

Main pedestrian links would be made from residential blocks to the neighborhood centers and

movement between blocks would be encouraged by public walkways connecting the centers of all blocks in a ring pattern.

Neighborhood centers would contain an elementary school, limited commercial facilities, and certain other community services. In conjunction with the elementary school there would be space devoted to active organized play and passive relaxation.

City

The city diagram is presented to show the principles of organization that should exist between housing and the city.

The commercial and industrial core of the city is defined by the major transportation lines. These would include highway and rail, and are presumed to be part of a regional transportation network connecting major urban areas. These transportation lines form an inner circle about the transportation center of the city. All goods and people arrive at this point and are then distributed outward to service the core area. At the periphery of the city there is a second circumferential belt which sets the limits of horizontal expansion.

The core area is cross shaped in form suggesting specialization of various sections, but with each having a direct connection to the transportation center.

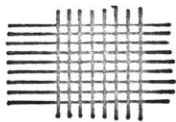
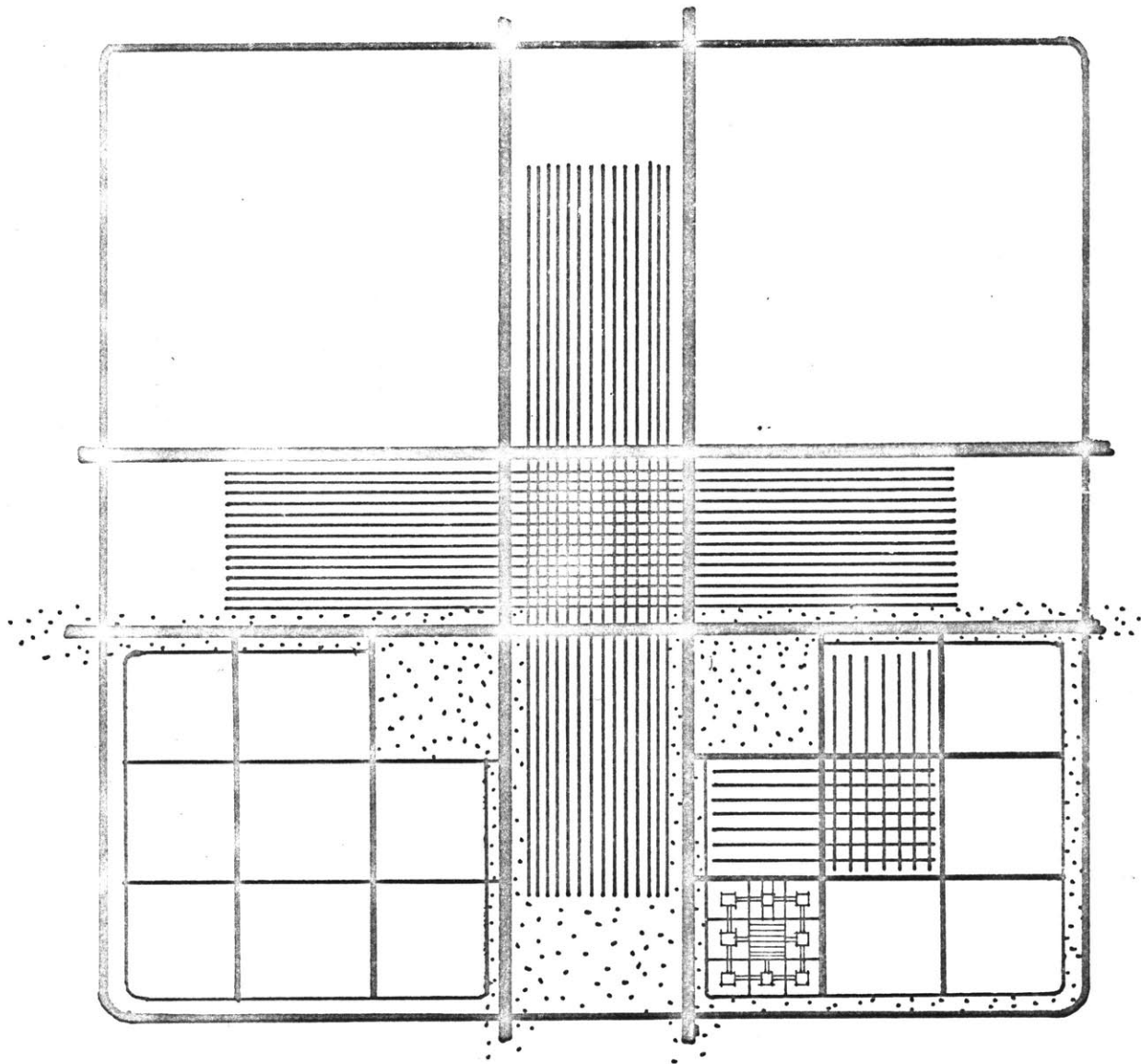
In addition to the small plazas which would occur within the core area, large park areas are retained adjacent to the core at most of its periphery. These open areas not only give relief from the dense development of the city, but also provide an opportunity for a clear visual expression of the core.

Each residential section of the city is well defined, consisting of five neighborhoods of low-rise housing and two neighborhoods of high-rise and low-rise mixed. The center of each section would contain a high school, non-specialty shopping, recreational, and other appropriate facilities. The section would have a population of approximately 40,000 persons.

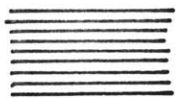
A circulation system links low-rise neighborhood developments and connects them to the sectional center.

The high-rise neighborhood would always be directly related to its own sectional center, the urban core, and open park area. In this manner, the high density housing would form the links of a ring development connecting the sectional centers to the city core and giving direction to the circulation between them.

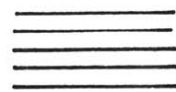
A DIAGRAM RELATING HOUSING TO THE CITY



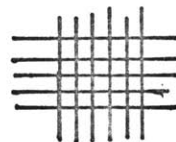
TRANSPORTATION CENTER



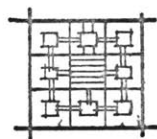
CITY CORE



HIGH-RISE & LOW RISE HOUSING



SECTIONAL CENTER



LOW-RISE NEIGHBORHOOD

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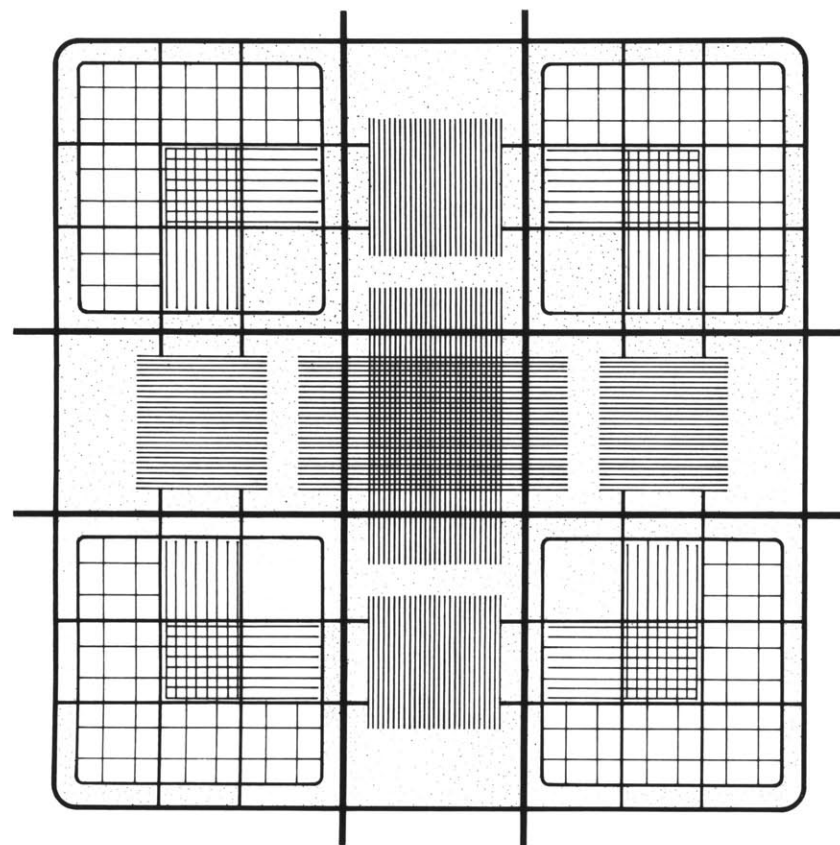
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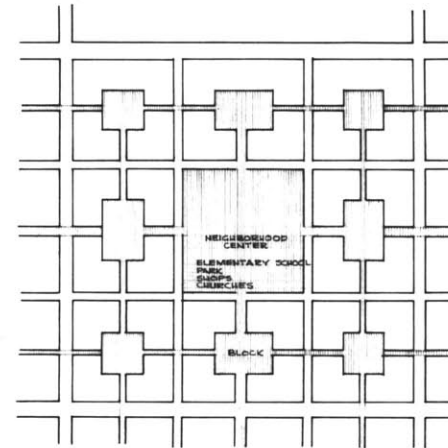
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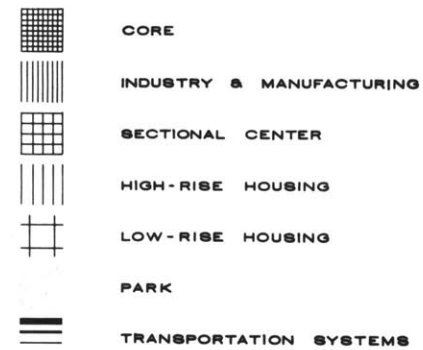
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ORGANIZATIONAL DIAGRAM



NEIGHBORHOOD DIAGRAM



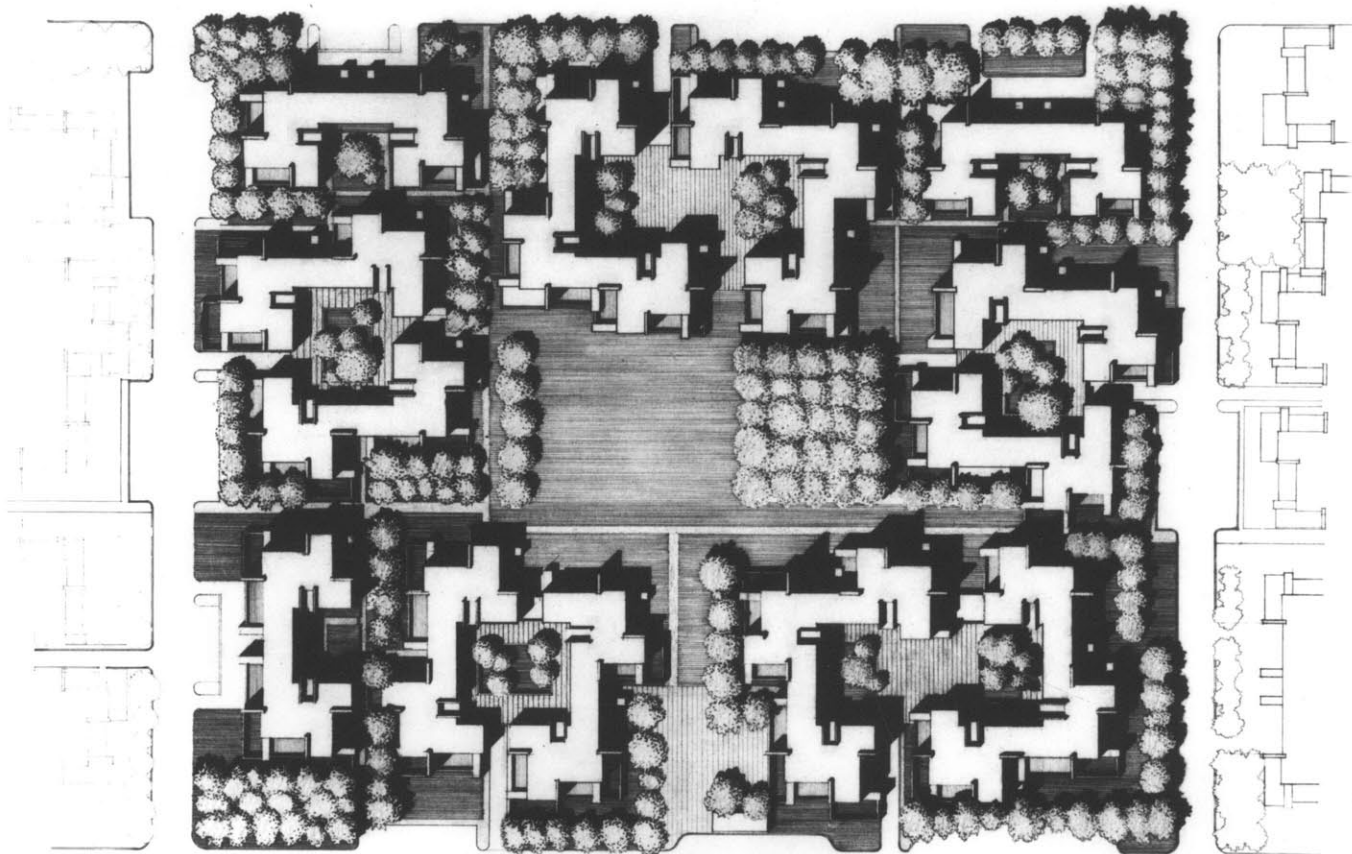
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MASTER IN ARCHITECTURE

AUGUST, 1960

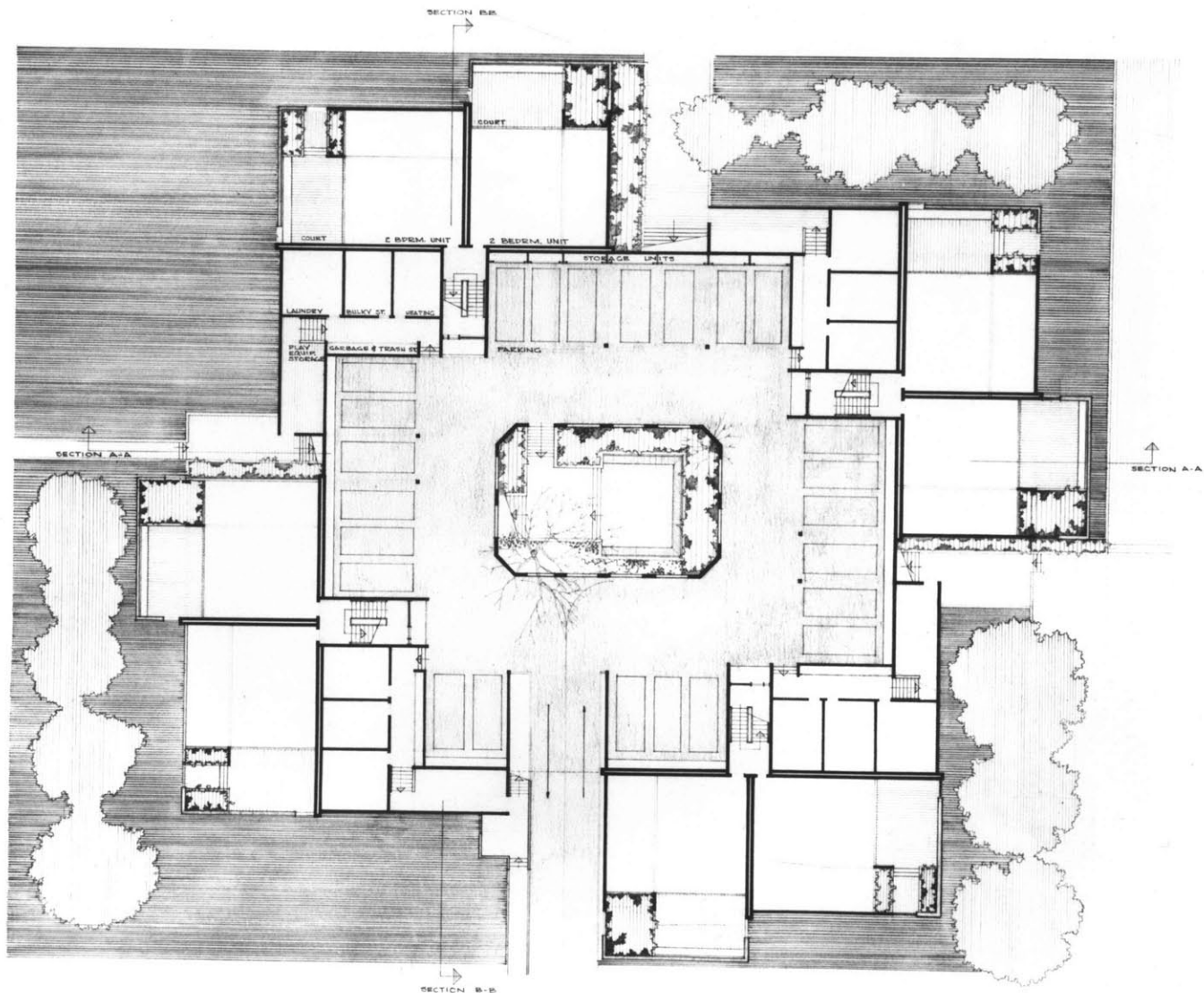
ROBERT J. KARN



NEIGHBORHOOD DEVELOPMENT

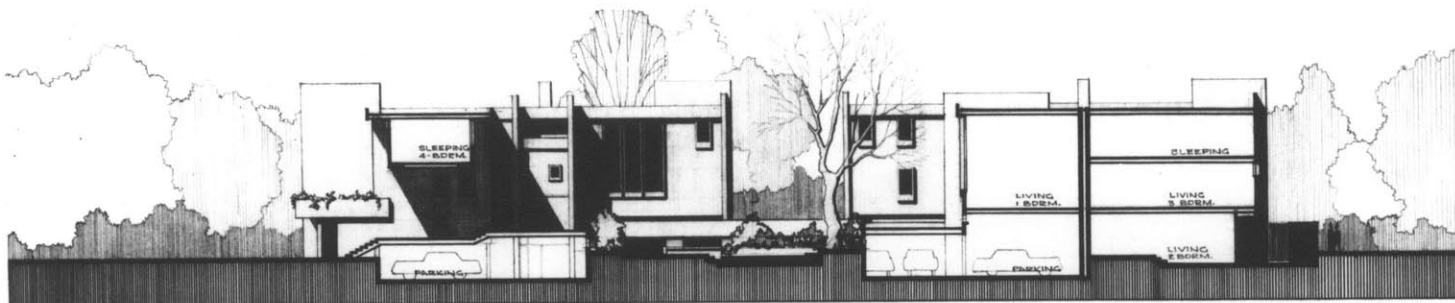
SITE PLAN

SCALE IN FEET 0 50 100 150 200

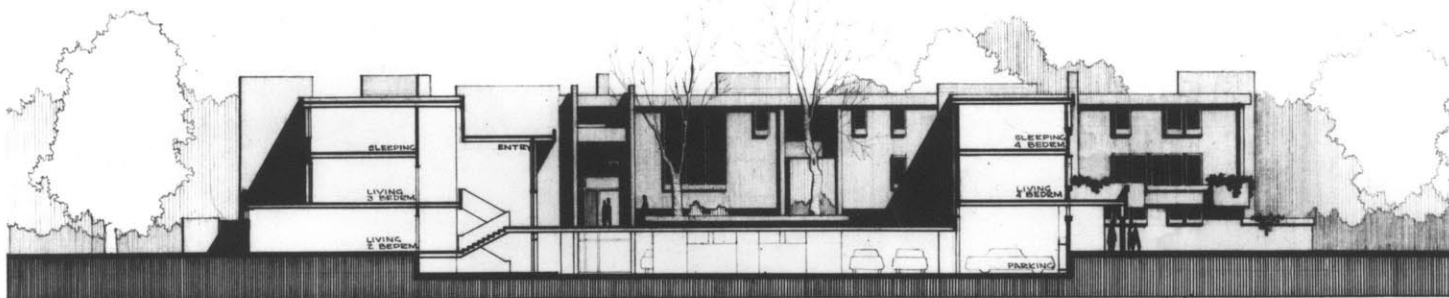


GROUP PARKING LEVEL PLAN

SCALE IN FEET 0 10 20 30 40 50 60



SECTION A-A



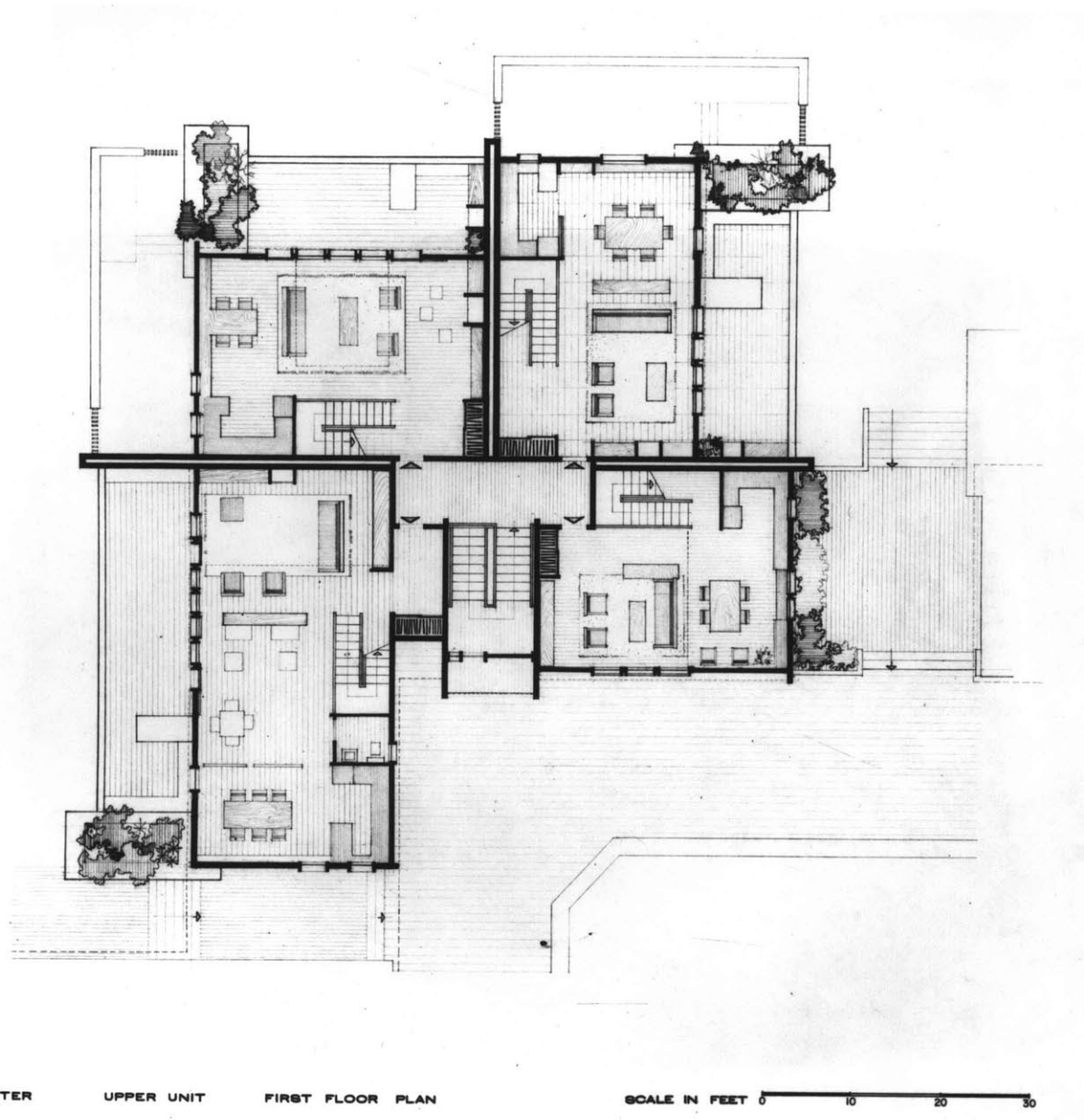
SECTION B-B

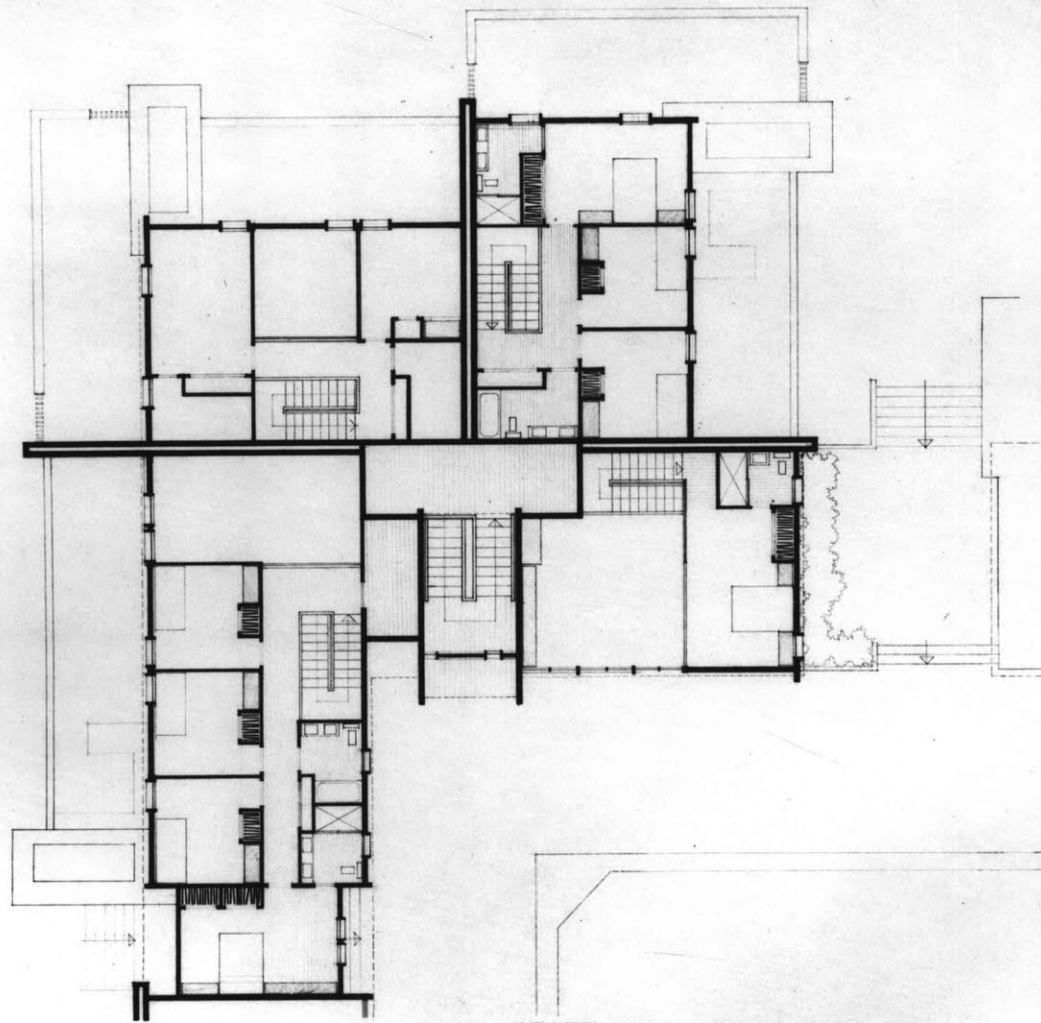
GROUP

ELEVATIONS - SECTIONS

SCALE IN FEET





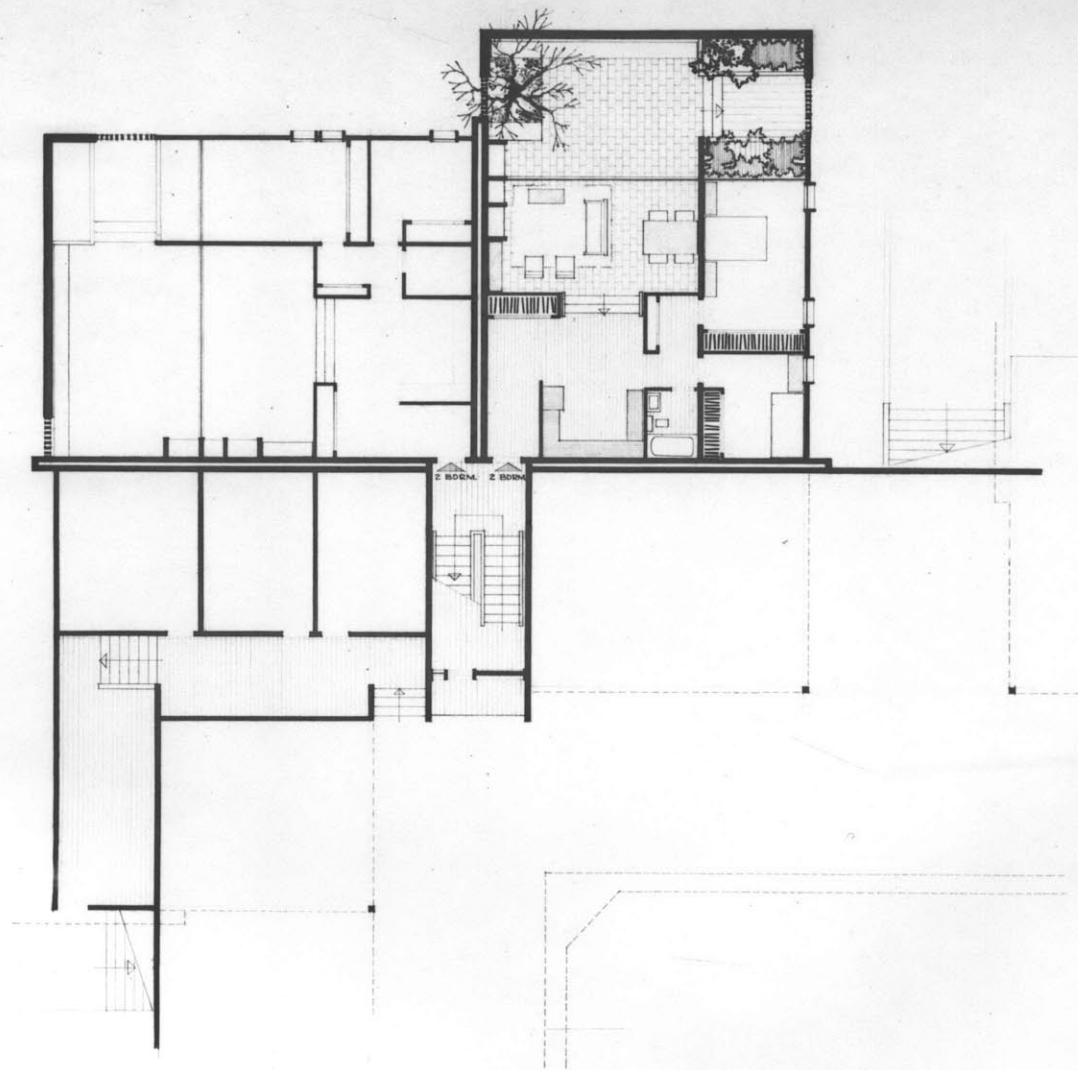


CLUSTER

UPPER UNITS

SECOND FLOOR PLAN

SCALE IN FEET 0 10 20 30



CLUSTER

LOWER UNITS

FLOOR PLAN

SCALE IN FEET 0 10 20 30